

Application No. 10/037,375
Response to Office Action

Customer No. 01933

Listing of Claims:

1. (Previously Presented) An electromagnetic drive for controlling an amount of light of a luminous flux, said electromagnetic drive comprising:

a solenoid having a coil whose winding axis is disposed in parallel with a direction of the luminous flux;

a movable plunger that is movable in parallel with the direction of the luminous flux by a magnetic force of the solenoid; and

a blade member driven by the movable plunger for controlling the amount of light of the luminous flux.

2. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 1, wherein a plurality of solenoids are provided, and the plurality of solenoids are magnetically connected via a yoke member.

3. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 1, wherein the movable plunger includes a band of projection provided around the movable plunger in a vicinity
5 of an end portion of the movable plunger, and wherein the

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movable plunger is moved in the solenoid using the band of projection.

4. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 1, further comprising:

5 a bearing portion for supporting the movable plunger at an end portion thereof exposed out of the solenoid.

5. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 2, wherein the plurality of solenoids have different central inner diameters from each other.

6. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 2, wherein the plurality of solenoids have different outer diameters from each other.

7. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 6, further comprising a bearing portion which supports the movable plunger at an end portion thereof exposed
5 out of the solenoid, and a band of projection formed on a

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peripheral surface in a vicinity of the end portion of the movable plunger to be fitted into the bearing portion, wherein the movable plunger is slidably movable in the bearing portion using the projection.

8. (Previously Presented) An electromagnetic drive for controlling an amount of light of a luminous flux, said electromagnetic drive comprising:

5 a solenoid having a coil whose winding axis is disposed in parallel with a direction of the luminous flux;

a movable plunger that is movable in a direction parallel to the direction of the luminous flux by a magnetic force of the solenoid;

10 a switching member for switching a direction in which a locomotive faculty of the movable plunger acts from the direction parallel to the direction of the luminous flux to a direction perpendicular to the direction of the luminous flux; and

15 a blade member driven by the locomotive faculty obtained by the switching member.

9. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 8, wherein the switching member pivots about the

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winding axis in parallel with the direction of the luminous
5 flux.

10. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 8, wherein a plurality of solenoids are provided, and the plurality of solenoids are magnetically connected by a yoke member.

11. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 8, wherein the plurality of solenoids have different central inner diameters from each other.

12. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 8, wherein the plurality of solenoids have different outer diameters from each other.

13. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 8, wherein the movable plunger includes a band of projection provided around the movable plunger in a vicinity
5 of an end portion of the movable plunger, and wherein the

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movable plunger is movable in the solenoid using the band of projection.

14. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 10, further comprising:

5 a bearing portion for supporting the movable plunger at an end portion thereof exposed out of the solenoid.

15. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 14, wherein the movable plunger includes a band of projection formed on a peripheral surface in a vicinity of the
5 end portion of the movable plunger to be fitted into the bearing portion, and wherein the movable plunger is movable in the bearing portion using the band of projection.

16. (Previously Presented) An electromagnetic drive for controlling an amount of light of a luminous flux, said electromagnetic drive comprising:

5 at least two coils magnetically connected in series whose winding axes lie perpendicular to a direction of the luminous flux;

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a movable plunger that is movable along one of the winding axes by a magnetic force of the coils; and

a blade member driven by the movable plunger for
10 controlling the amount of light of the luminous flux.

17. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 16, wherein the coils have different central inner diameters from each other.

18. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 16, wherein the coils have different outer diameters from each other.

19. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 16, wherein the coils are disposed along the direction of the luminous flux in such a manner that the
5 winding axes of the coils are respectively lying on planes perpendicular to the direction of the luminous flux, in parallel with each other.

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20. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 16, wherein the movable plunger includes a band of projection provided around the movable plunger in a vicinity
5 of an end portion of the movable plunger, and wherein the movable plunger is movable along the one of the winding axes using the band of projection.

21. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 19, further comprising:

a bearing portion for supporting the movable plunger at
5 an end portion thereof exposed out of the coil having the one of the winding axes along which the plunger is movable.

22. (Currently Amended) An electromagnetic drive for controlling an amount of light of a luminous flux, said electromagnetic drive comprising:

a plurality of solenoids having coils whose winding axes
5 lie perpendicular to a direction of the luminous flux;

a movable plunger that is movable along one of the winding axes by a magnetic force of the solenoid; and

a blade member driven by the movable plunger for controlling the amount of light of the luminous flux;

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10 a bearing portion for supporting the movable plunger at
an end portion thereof exposed out of the solenoid;

wherein the plurality of solenoids are disposed along the
direction of the luminous flux in such a manner that the winding
axes of the coils are respectively lying on planes perpendicular
15 to the direction of the luminous flux, in parallel with each
other;

wherein the movable plunger includes a band of
projection, which has a periphery that defines a portion of a
surface of a sphere, formed on a peripheral surface in a
20 vicinity of the end portion of the movable plunger to be
fitted into the bearing portion, and wherein the movable
plunger is movable in the bearing portion using the band of
projection.

23. (Previously Presented) An electromagnetic drive for
controlling an amount of light of a luminous flux comprising:

a plurality of solenoids having respective center axes
corresponding to respective different lines;

5 a movable plunger that is movable along one of the center
axes of the plurality of solenoids by a magnetic force of the
plurality of solenoids; and

a yoke member for forming magnetic fluxes generated from
the plurality of solenoids into a loop.

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24. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 23, wherein the plurality of solenoids have different central inner diameter from each other.

25. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 23, wherein the plurality of solenoids have different outer diameters from each other.

26. (Original) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 23, wherein the plurality of solenoids are disposed in parallel with each other.

27. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 23, wherein the movable plunger includes a projection provided around the movable plunger in a vicinity of an end
5 portion of the movable plunger, and wherein the movable plunger is moved in the solenoid using the projection.

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28. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 26, further comprising:

5 a bearing portion for supporting the movable plunger at an end portion thereof exposed out of the solenoid.

29. (Previously Presented) An electromagnetic drive for controlling the amount of light of a luminous flux according to Claim 28, wherein the movable plunger includes a band of projection formed on a peripheral surface in a vicinity of the
5 end portion of the movable plunger to be fitted into the bearing portion, and wherein the movable plunger is movable in the bearing portion using the band of projection.